

November 2, 2012

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Deputy Commission Grant:

On behalf of the Minneapolis Saint Paul Solar Cities program, we express our gratitude to the Department of Commerce, Division of Energy Resources for organizing and hosting the distributed generation (DG) workshop on October 11th. We appreciate the substantial effort by the Division to engage a broad range of stakeholder positions and perspectives in the ongoing discussion. We support this effort to better understand how to meet Minnesota's policy goals on distributed generation and to best utilize Minnesota's energy resources to meet our energy needs.

Minneapolis and Saint Paul, through the Solar Cities program, invested substantial resources to engage in solar energy market transformation activities, the goal of which is to help bring about a self-sustaining solar energy industry and thus capture the value of Minnesota's energy resources. To that end, the cities' staff and consultants, working with experts from U.S. national laboratories, conducted extensive research and initiated a number of programmatic efforts to remove market barriers, overcome market failures, and accelerate market movement for investment in Minnesota's solar energy resources. These comments are offered based on the findings of and recommendations by the Solar Cities program, and focus primarily on addressing Minnesota's solar energy distributed generation opportunities.

Recommendations

We agree with the Department's summary of conclusions to be drawn from the October 11th presentations and discussion:

- There is a significant knowledge gap of values and costs; while there are studies and models available from other parts of the country, we need to be thoughtful when translating and applying these approaches to Minnesota.
- In the near term, there is a need to improve DG accessibility and distribution transparency in order to support customer choice and state policy and to gain experience to inform evaluation of costs and benefits; near-term options include: improved net metering policies, optional 'buy all / sell all' approach, 3rd party ownership, meter aggregation; review standby / demand rates.
- In the long term, at higher penetrations of DG (much higher than current and anticipated near-term levels), there would be a need to realign business models and regulatory structures to address unresolved cost shifts.

Based on its investigation of Minnesota policies and on the review of program successes and failures in other states, in 2011 the Solar Cities program made a number of recommendations to the Minnesota legislature. Prominent among the recommendations was the need for direct and concrete action to jumpstart Minnesota's moribund market for investment in commercial, industrial, and institutional on-site solar resources. Minnesota's net metering law, in particular, has not changed commensurately with changes in the solar energy market. As a consequence Minnesota's distributed solar energy opportunities remain unrealized while investment flows readily to other states that have adopted net metering best practices. Other policy barriers similarly limit investment in Minnesota's solar resources. Consequently, we respectfully offer the following recommendations that build upon the October 11th workshop discussion and that specify several short and long-term programmatic goals.

Net Metering. Net metering is an easily understood and relatively easily implemented means of capturing currently unrealized opportunities of larger scale DG resources in Minnesota. In the near term, the existing

net metering standards should be modified to incorporate DG opportunities for large commercial, industrial, and institutional energy users. Learning from other states and Minnesota's own experience, however, the expansion of net metering should be done in a manner to limit net metering to net metering; net metering is not the appropriate tool to integrate independent power producers into the utility system. Future net metering customers should be limited to capturing DG resources at a level commensurate with those customers' energy consumption. Standards for tracking and valuing excess generation should discourage, rather than encourage, energy production in excess of on-site usage. Meter aggregation should be allowed, but limited to the same site or campus as the DG resource and within a discrete distribution circuit or system to maximize capture of distribution system benefits of DG. For small utilities, changing the net metering regime may require setting a utility system cap on net metering generation in order to ensure that smaller utilities do not face unpredictable or unexpected changes in DG generation levels.

Third-Party Ownership, Financing. The Solar Cities program recommended that existing uncertainty associated with third-party ownership of DG, including the use of purchased power agreements (PPAs) between third-parties and end-users, be addressed by clearly defining PPAs as distinct from retail electric sales. Consistent with the Solar Cities' recommendations on net metering, the definition needs to distinguish between PPAs designed to serve on-site load with on-site resources, and PPAs associated with independent power production. Both types of DG development are important. But by distinguishing the former from the latter, state policy can enable significant investment in solar DG to serve on-site load, ensure end-users get a transparent value-based transaction, and limit concerns about eroding service territory franchises.

Valuation of DG production. While net metering is an easily understood and implemented tool, several alternatives to the traditional rate classes/net metering regime should also be considered as DG implementation ramps up. Key to successful implementation of these alternatives is determining how to fairly value the benefits provided and the costs created by different types of DG resources on the grid. For solar energy, two promising models were discussed at the October 11th workshop. These models could provide a foundation for eventually moving beyond net metering and implementing a "buy all/sell all" concept or "standard offer" rates for. Moreover, careful and fair analysis of value and cost will inform the longer-term discussion of realigning utility business models and regulatory structures.

Realigning utility and regulatory business models. Successful DG market transformation efforts will eventually create a situation where DG is an important and significant part of our energy supply portfolio. DG customers have distinct load and usage profiles on the utility system, changing the nature of rate classes and the distribution of cost responsibility. Successful market transformation will also create the need for new resource planning concepts, as DG capacity decisions are increasingly made outside the utility planning process. Minnesota should assess best practices that are developing in other states, identify new concepts in resource planning and acquisition that incorporate a burgeoning DG market, and create policy priorities to guide Minnesota toward the next generation utility system.

Potential Subsidy Risks of Net Metering

Several presenters and panel responses focused on the issue of whether net metering creates intra-class subsidies from non-participating customers to participating customers. The Minneapolis Saint Paul Solar Cities program commissioned work by national experts on net metering best practices that investigated this particular concern and made two specific findings:

1. No state having a net metering program had identified a net metering subsidy, although the lack of a finding was primarily because very little investigation had been conducted. Most states had chosen to mitigate the financial risks associated with net metering via system caps or similar protections.
2. Even in states with aggressive net metering programs, there was no measureable impact (either positive or negative) of net metering to non-participating ratepayers.

In the workshop presentations, some data were presented to demonstrate an intra-class subsidy. The analysis asks a legitimate question, but draws conclusions based on assumptions about "fixed" costs that are inconsistent with industry norms for evaluating costs and cost causation. The conclusions were also based

upon the use of system-wide average costs to value resources that actually offset marginal, rather than average, costs. Removing the effect of these assumptions is substantial, potentially enough to wipe out the entire alleged subsidy.

In the Dakota Electric example, the value of residential net metering generation on the utility system was estimated to be about \$0.027/kWh. In contrast, the comprehensive solar valuation model presented by the Rocky Mountain Institute, used in Austin Texas, set the value of residential solar net metering generation at \$0.128/kWh, a value almost 500% greater than the Dakota Electric example. The costs in the Austin Texas system and the costs faced by Minnesota co-ops are going to be different, and we should not assume that a full analysis of DG system benefits in Minnesota will result in a residential solar DG value of \$0.128/kWh. It must be noted, however, that the cost-based residential rates charged in Austin are quite comparable to the cost-based rates charged by many Minnesota utilities (IOUs, municipals, and co-ops). The percentage difference in DG system benefits (between Austin Texas and Minnesota) is unlikely to be in the triple digits, much less 500%.

Regardless, the risk associated with intra-class subsidies from net metering is of little consequence when the total net metering generation on a given utility system is still less than 1% of total usage, as noted in the findings of the Solar Cities net metering study. Given that we cannot say with certainty even whether such a subsidy flows to or from non-participants, subsidy risk should not be an obstacle to taking action. Simple and easily understood protections such as system-wide net metering cap are probably unnecessary for larger utilities, but can mitigate uncertainty particularly for smaller utilities that have a higher level of uncertainty due to the relative size of DG resources to total energy consumption.

As DG penetration levels increase, however, Minnesota should be prepared to evaluate and mitigate subsidy risks and other considerations of managing a generation portfolio that includes significant levels of DG resources. Ramping up the use of DG resources will allow Minnesota policy makers to use empirical information for decision making on issues such as intra-class subsidies, whether the subsidy flows to or from non-participating customers. As more information becomes available, the subsidy issue should be framed by answering two questions:

1. Does net metering, after appropriate valuation of the DG resource and assessment of costs imposed on the utility system, consistently or necessarily create an intra-class subsidy?
2. If a subsidy is consistently or necessarily created by net metering, is the subsidy significant enough (relatively to other intra-class subsidies that are routinely tolerated) to warrant action?

Finally, in recommending using a net metering framework for ramping up the use of DG resources in the near term, the Solar Cities' findings do not imply that net metering is the only tool, nor the programmatic end-point, for capturing DG opportunities and fulfilling state policy goals. The long-term solution to meeting all Minnesota's energy policy goals must fulfill environmental, economic, and social goals. These goals include minimizing greenhouse gas emissions, ensuring a fair and equitable rate structure and reasonable rates, and maintaining a reliable electric grid. While net metering provides a near-term path to realigning electric industry business models and regulatory systems, it is likely just a first step in that process.

We appreciate the opportunity to participate in this venue and to present the findings and recommendations of the Solar Cities program. We look forward to working with utility, business, consumer, and regulator stakeholders to better meet state policy goals and increase use of Minnesota's energy resources.

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